

FIG. 1

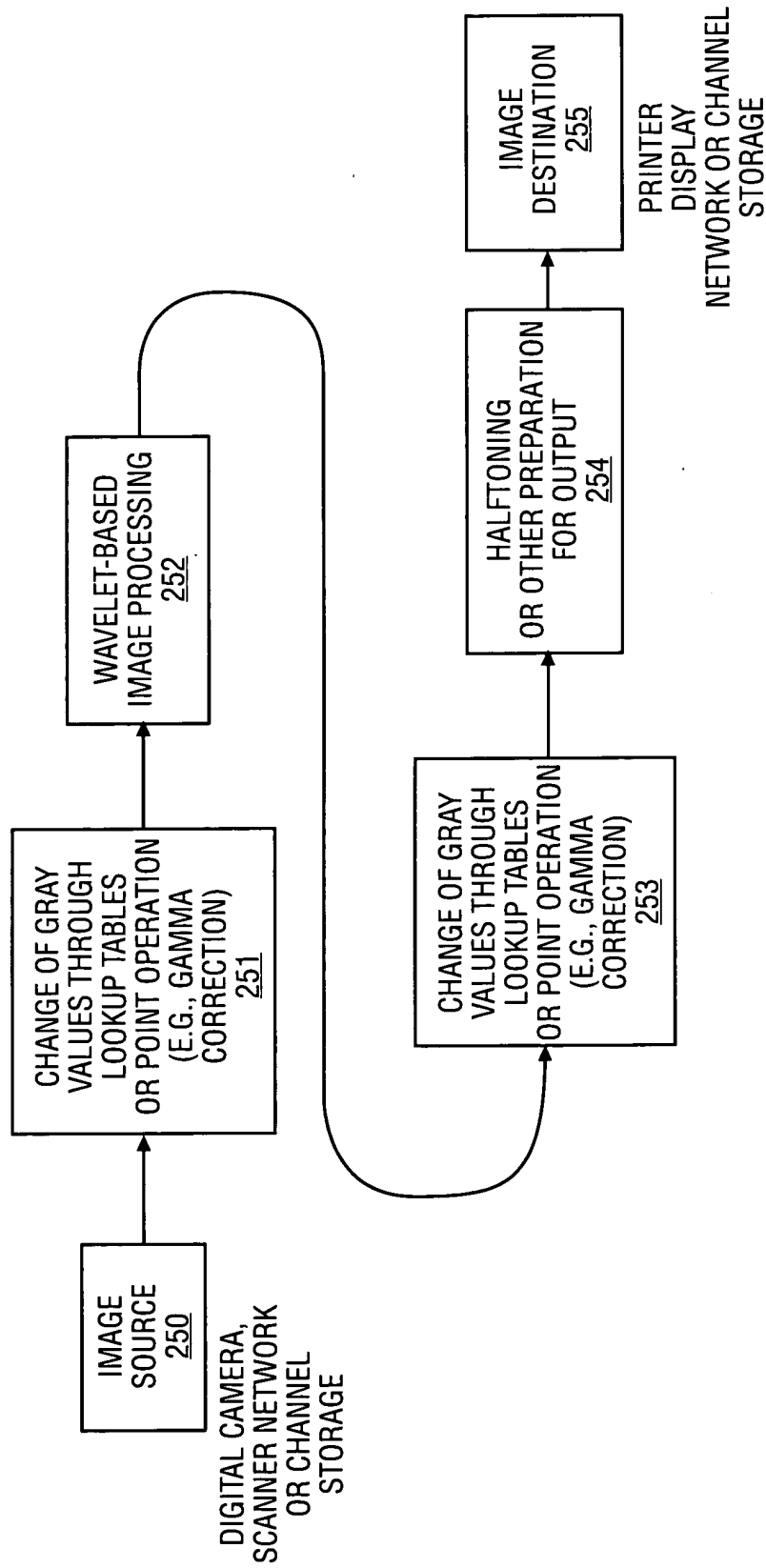


FIG. 2A

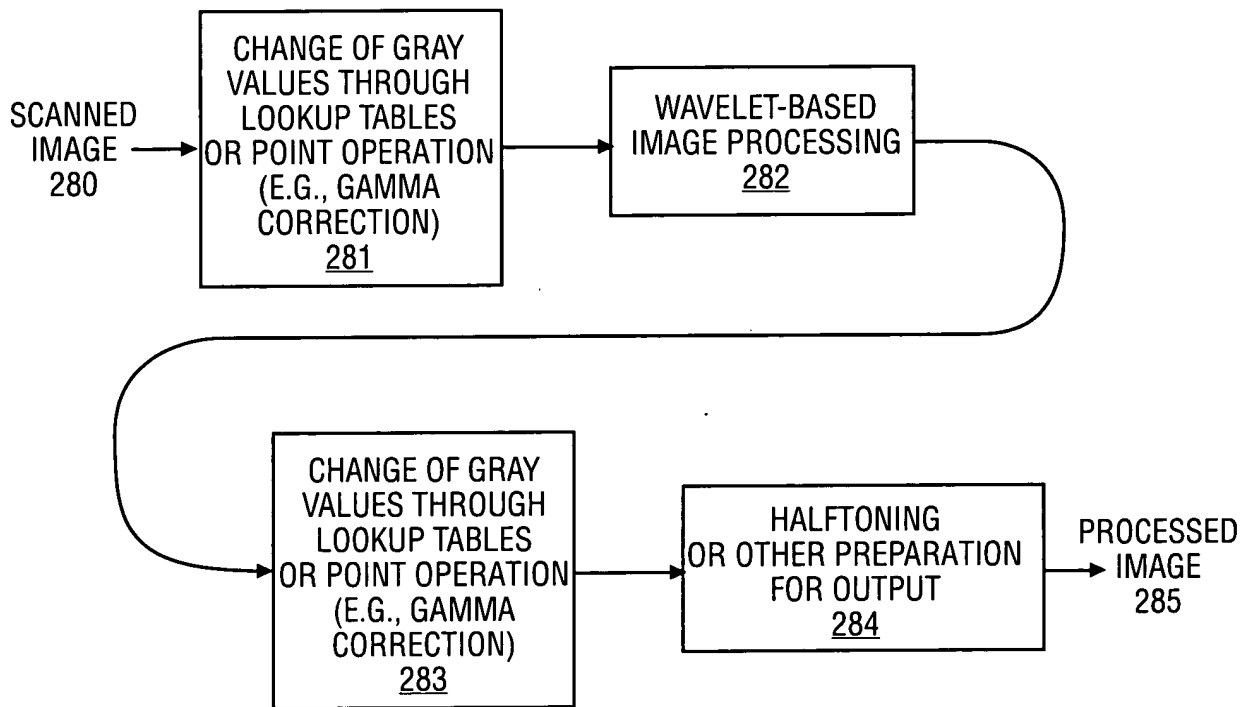


FIG. 2B

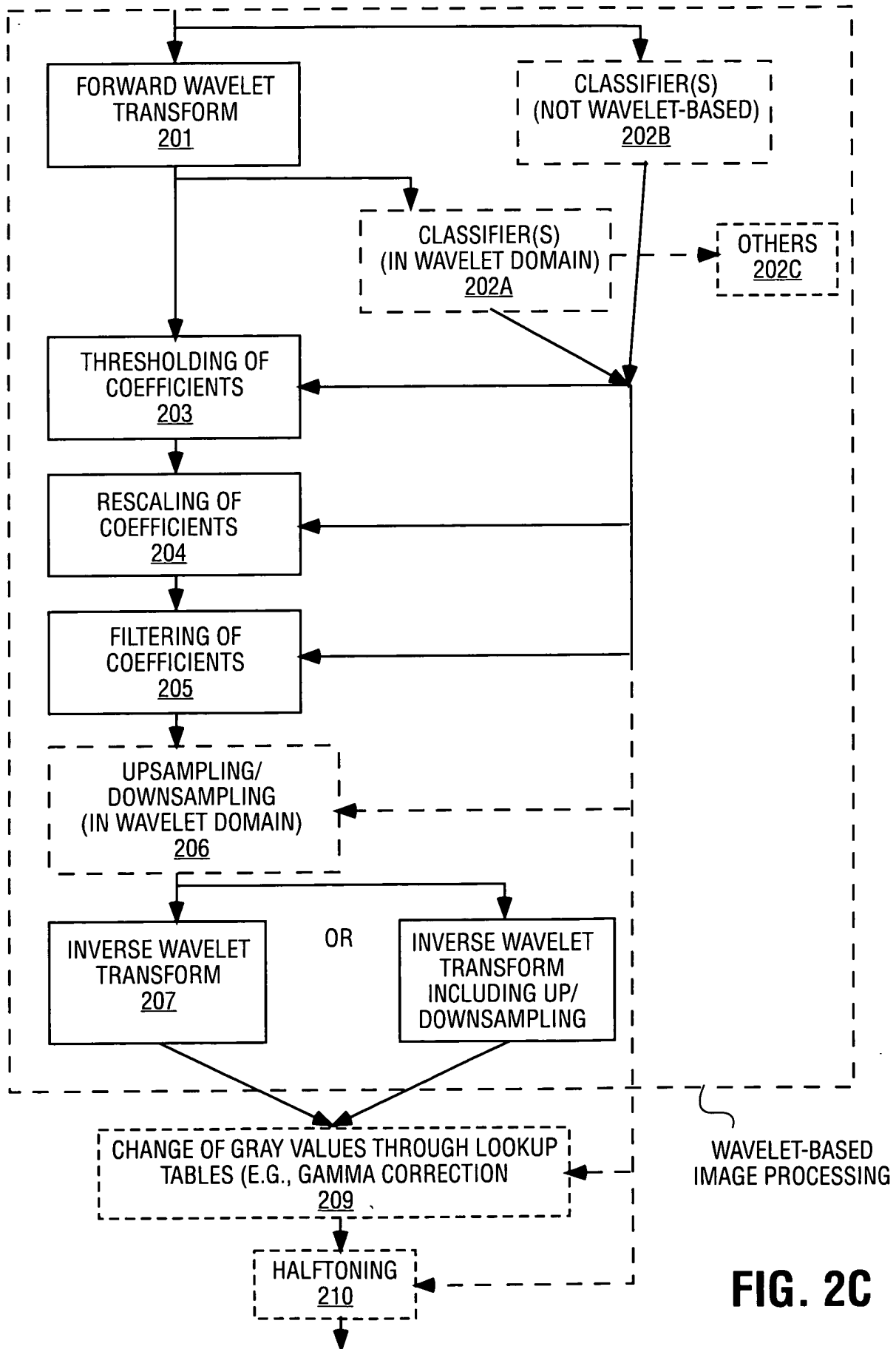


FIG. 2C

$$\begin{bmatrix} 1 & 1 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 1 & 1 & 1 \end{bmatrix}$$

halftone pattern in
image

diagonal line pattern
in image

$$\begin{bmatrix} 0 & 2 & 0 & -2 & 0 & 2 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -2 & 0 & 2 & 0 & -2 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & -2 & 0 & 2 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 2 & 0 & -2 & 0 & 2 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ -2 & 0 & 2 & 0 & -2 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 2 & 0 & -2 & 0 & 2 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ -2 & 0 & 2 & 0 & -2 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 2 & 0 & -2 & 0 & 2 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ -2 & 0 & 2 & 0 & -2 & 0 \end{bmatrix}$$

halftone pattern in HL, LH, HH band (left to right)

$$\begin{bmatrix} 1 & 1 & -1 & -1 & 0 & 1 \\ 1 & -1 & -1 & 0 & 1 & 1 \\ -1 & -1 & 0 & 1 & 1 & 0 \\ -1 & 0 & 1 & 1 & 0 & -1 \\ 0 & 1 & 1 & 0 & -1 & -1 \\ 1 & 1 & 0 & -1 & -1 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -1 & -1 & 0 & 1 \\ 1 & -1 & -1 & 0 & 1 & 1 \\ -1 & -1 & 0 & 1 & 1 & 0 \\ -1 & 0 & 1 & 1 & 0 & -1 \\ 0 & 1 & 1 & 0 & -1 & -1 \\ 1 & 1 & 0 & -1 & -1 & 0 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 1 & 1 & -1 & 0 & -1 \\ 1 & 1 & -1 & 0 & -1 & 1 \\ 1 & -1 & 0 & -1 & 1 & 1 \\ -1 & 0 & -1 & 1 & 1 & -1 \\ 0 & -1 & 1 & 1 & -1 & 0 \\ -1 & 1 & 1 & -1 & 0 & -1 \end{bmatrix}$$

diagonal line pattern in HL, LH, HH band (left to right)

figure 4A

second level

| | | | |
|----|----|----|----|
| LL | LH | HL | MH |
|----|----|----|----|

first level

| | | |
|----|----|----|
| LH | HL | HH |
|----|----|----|

classification criterion

classifier image

figure 4B

000000

LH

| | | |
|----------------------|----------------------|----------------------|
| x ₁ | x ₂ | x ₃ |
| x₄ | x₅ | x₆ |
| x ₇ | x ₈ | x ₉ |

HL

| | | |
|----------------|----------------------|----------------|
| x ₁ | x₂ | x ₃ |
| x ₄ | x₅ | x ₆ |
| x ₇ | x₈ | x ₉ |


HH

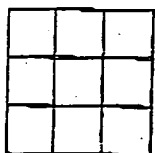
| | | |
|----------------------|----------------------|----------------------|
| x ₁ | x ₂ | x₃ |
| x ₄ | x₅ | x ₆ |
| x₇ | x ₈ | x ₉ |

HH

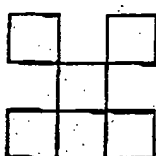
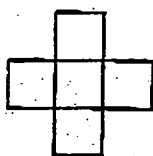
| | | |
|----------------------|----------------------|----------------------|
| x₁ | x ₂ | x ₃ |
| x ₄ | x₅ | x ₆ |
| x ₇ | x ₈ | x₉ |

FIG. 5

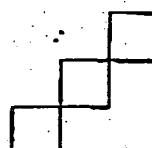
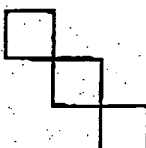
(A) 



(B)



(C)



(D)

figure 6

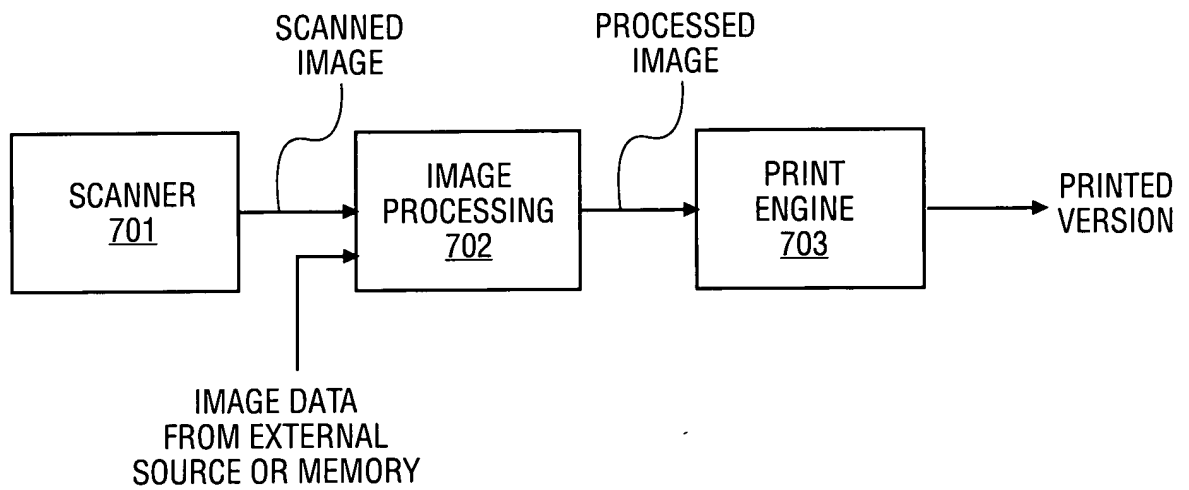
[illegible]

FIG. 7

800

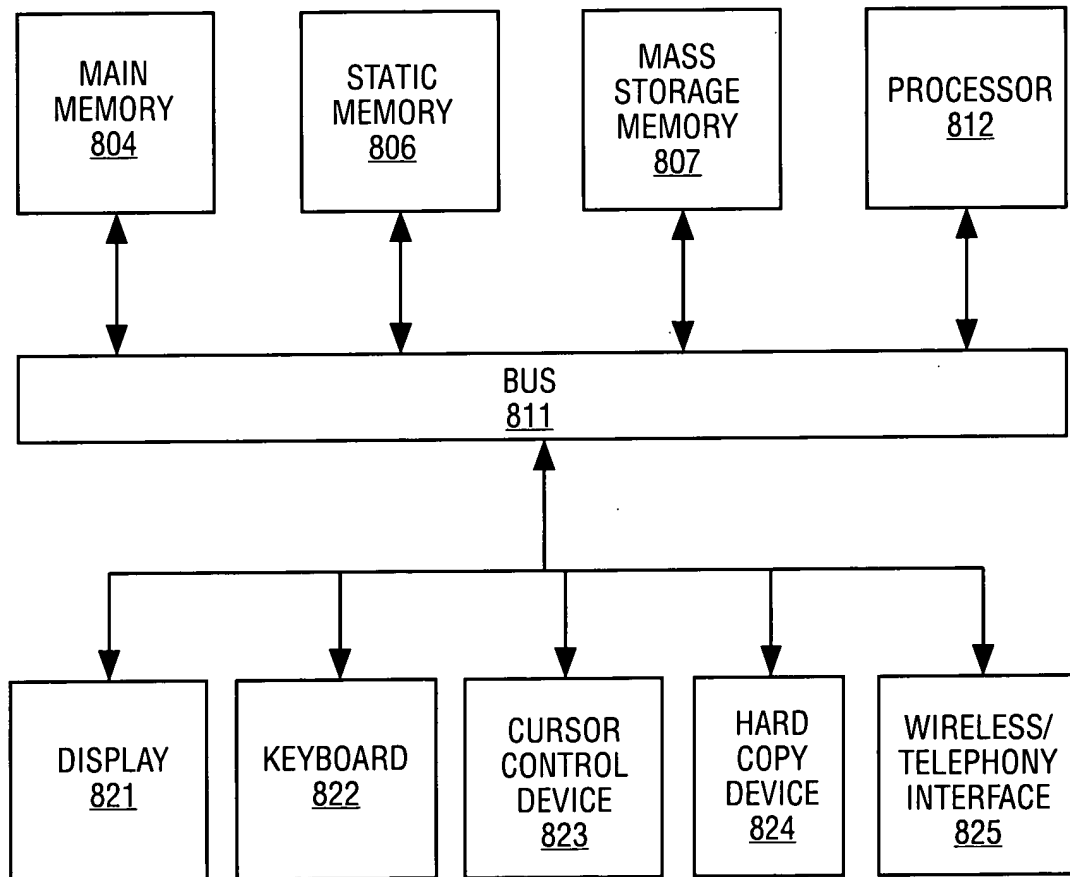


FIG. 8